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Reply

Visualising and Thinking and Interpreting. Response to the Burstyn and De Roos Comments on Sorahan, T. Multiple Myeloma and Glyphosate Use: A Re-Analysis of US Agricultural Health Study (AHS) Data. *Int. J. Environ. Res. Public Health* 2015, *12*, 1548–1559

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I am grateful to the Editor for the opportunity of responding to the recent paper of Burstyn and De Roos [1], that is in part, a critical commentary of my own analysis of data from the US Agricultural Health Study (AHS) concerning the findings for multiple myeloma and glyphosate use [2].

Firstly, I agree with Burstyn and De Roos that the more important findings from any epidemiological study are those relating to levels of estimated or measured exposure (so-called dose-response analyses) rather than simple ever/never exposed comparisons. That is why, in my own analyses, I showed the results of eight dose-response analyses; none was statistically significant and most were a long way from being statistically significant. So why did I also put some considerable effort into working out whether there was any basis for preferring one of the two findings supplied by De Roos et al. [3] for ever-use of glyphosate? [3]: Rate ratio (RR) of 1.1, 95% Confidence Interval (CI) 0.5 to 2.4, in full dataset adjusted for age only; RR of 2.6, 95% CI 0.7 to 9.4, in restricted dataset with adjustment for many variables. It is because one could be reasonably confident that one or other of these values would be used in future meta-analyses that would, by necessity, be limited to making use of these simplistic overall findings. It would, therefore, be important to know which estimate could be relied upon. I have checked the logic and language in my original paper and my conclusion that the risk estimate of 2.6 arose from the use of a restricted dataset that, probably by chance, turned out to be unrepresentative, is correct, polite and fair. Burstyn and De Roos [1] would appear to agree with this when they state 'there is likely selection bias adversely affecting the analysis with ever- vs. never-exposed.'

Burstyn and De Roos [1] are concerned about relying on 'intuition', and sole reliance on any single skill or aptitude is probably dangerous. But on first reading of the De Roos et al. paper [3] more than ten years ago, I strongly suspected that something very odd must be going on to produce such disparate findings for ever-use of glyphosate. Whether that is intuition or experience is a moot point.

Finally, I fully agree with Burstyn and De Roos [1] that an updated AHS needs to be analysed. The pesticide applicators that are participating in this key survey are stakeholders. Can't they make representations to bring such an analysis about?

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Conflicts of Interest: The author has received consultancy fees and expenses from the Monsanto Company in recent years, most notably to carry out secondary analyses of the AHS, to attend the IARC Monograph meeting for

Volume 112 in Lyon, Frances, as an observer, to take part in an Expert Panel Review, and to make epidemiological presentations to meetings and conferences in the USA and China.

References

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